

# Widget Summit: **Advanced JavaScript**

**Joseph Smarr**

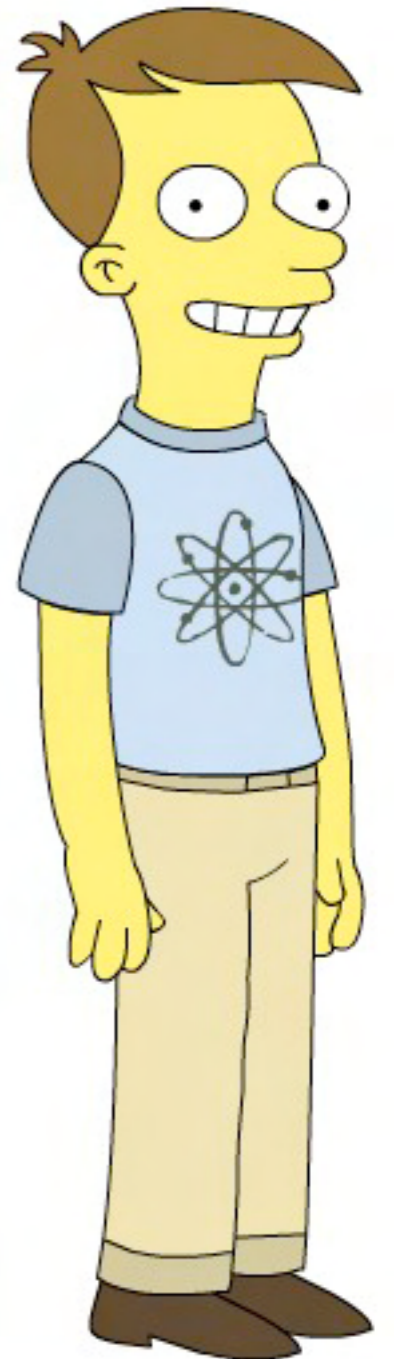
Plaxo, Inc.

October 16, 2007

# About me

- Chief Platform Architect at Plaxo
  - First employee (March 2002)
  - Architect and lead developer for Plaxo Online
- Abusing web browsers since 1993 (Mosaic)
  - Plaxo Online 2.0 (AJAX via iframes in 2004)
  - Plaxo's Address Book Access Widget
  - JavaScript Wormhole

<http://JosephSmarr.com>



# About Plaxo



- Smart Address Book
  - Syncs address book and calendar with lots of places
  - User updates their contact info à you get it automatically



- Founded in 2002, ~50 employees, 15M+ users
  - Backed by Sequoia, Ram Shriram, Tim Koogole, et al

Plaxo 3.0

plaxo beta

Zoe Marlow  
Last updated yesterday [edit profile](#)

Switch to Plaxo Classic | Settings | Feedback | Privacy | Sign Out

Contacts Tasks

Calendar Pulse Notes De-Duper

June 2007 [Add event](#) Upcoming Month Week Day

Today Thursday, June 14th

all day Flag Day  
1 earlier event

2:00 pm Check-in with agency  
Currently 2:34 PM

Tomorrow Friday, June 15th

10:00 am 1:1 with Mischa  
11:30 am Speech at BASMA

Next three weeks

Sun	Mon	Tue	Wed	Thu	Fri	Sat
10 5p Dinner w/ Gra	11 Lloyd in Ohio 11a call with Pat 3p Launch Plan	12 10a All-Hands 1p Product te 5:30p Potluck at	13 8:30a Dentist ap 10a Meeting w 3p 1:1 w/ Joh 7p Dinner w/	TODAY 14 Flag Day 8:30a Monthly Pl 2p Check-in v	15 10a 1:1 with 11:30a Speech a	16 4p Ethan's birthd
17 Father's Day 11a Father's Day	18 3p Launch Plann 4p Call with Oba 6p Networking ev	19 10a All-Hands 1p Product tear	20 11a Photo shoot 3p 1:1 w/ John	21 12:30p Lunch wt 2p Check-in	22 10a 1:1 with Mis 2p Website rea	23 Yosemite!
24 Yosemite!	25 3p Launch Plann	26 10a All-Hands	27 10a Add Plann	28 10a Add Plann	29 10a Add Plann	30 10a Add Plann

Paradise, CA [change](#)

Today Clear H 95° L 66°  
Currently: 95°

Tomorrow Clear H 91° L 65° [more »](#)

Countdowns [add](#)

- Lilly's Birthday 45 days
- Christmas 194 days
- My Birthday 332 days

13 contacts in 'Contacts'

[Add contact](#) [List](#) [Block](#)

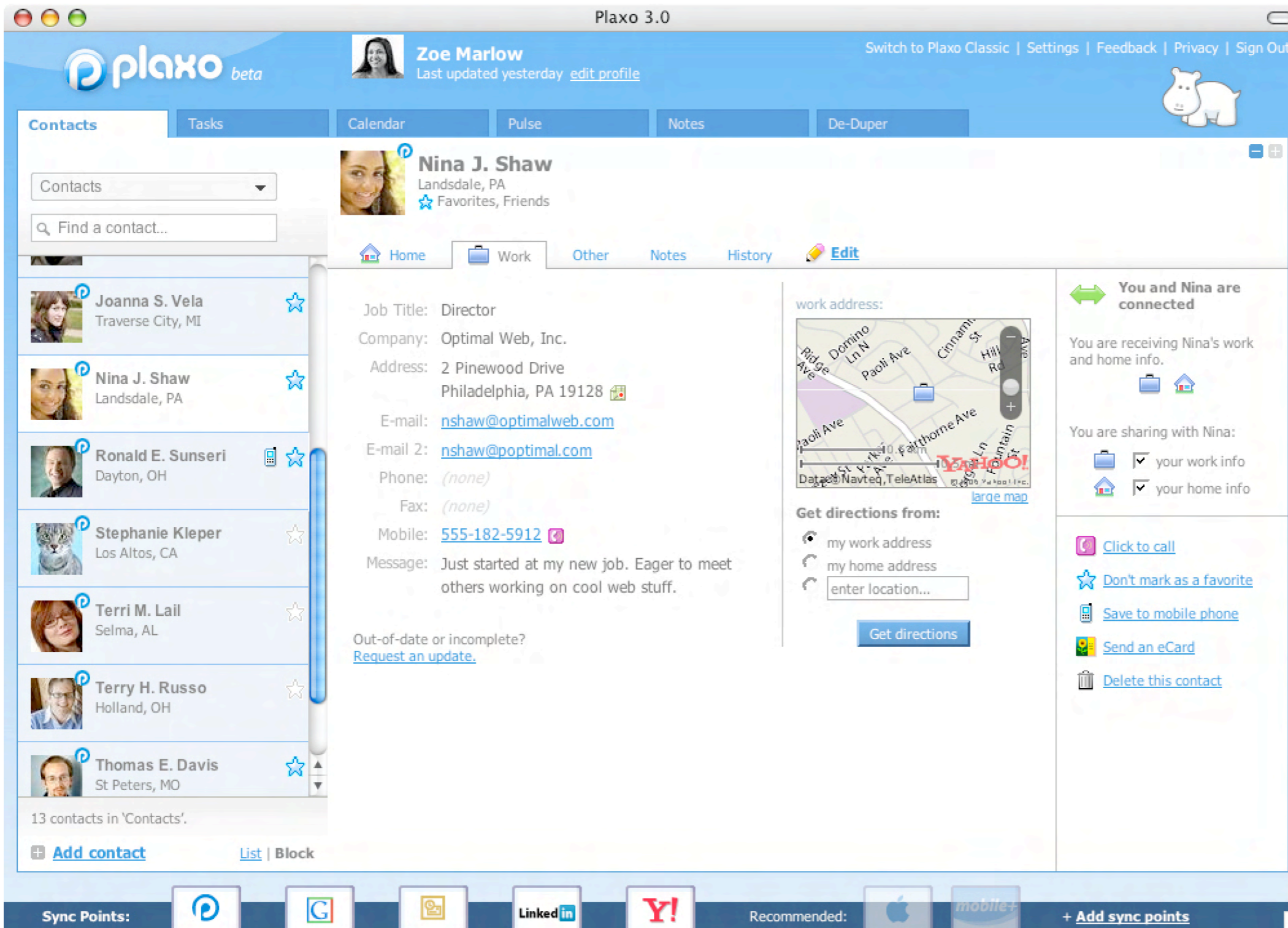
Calendars  Show weekends

Sync Points: Recommended: [+ Add sync points](#)

# Plaxo Online

AJAX Desktop  
[beta.plaxo.com](http://beta.plaxo.com)

- Flexible desktop
- Contacts
- Calendar
- Tasks
- Notes
- Sync dashboard
- Pulse
- Profile / settings



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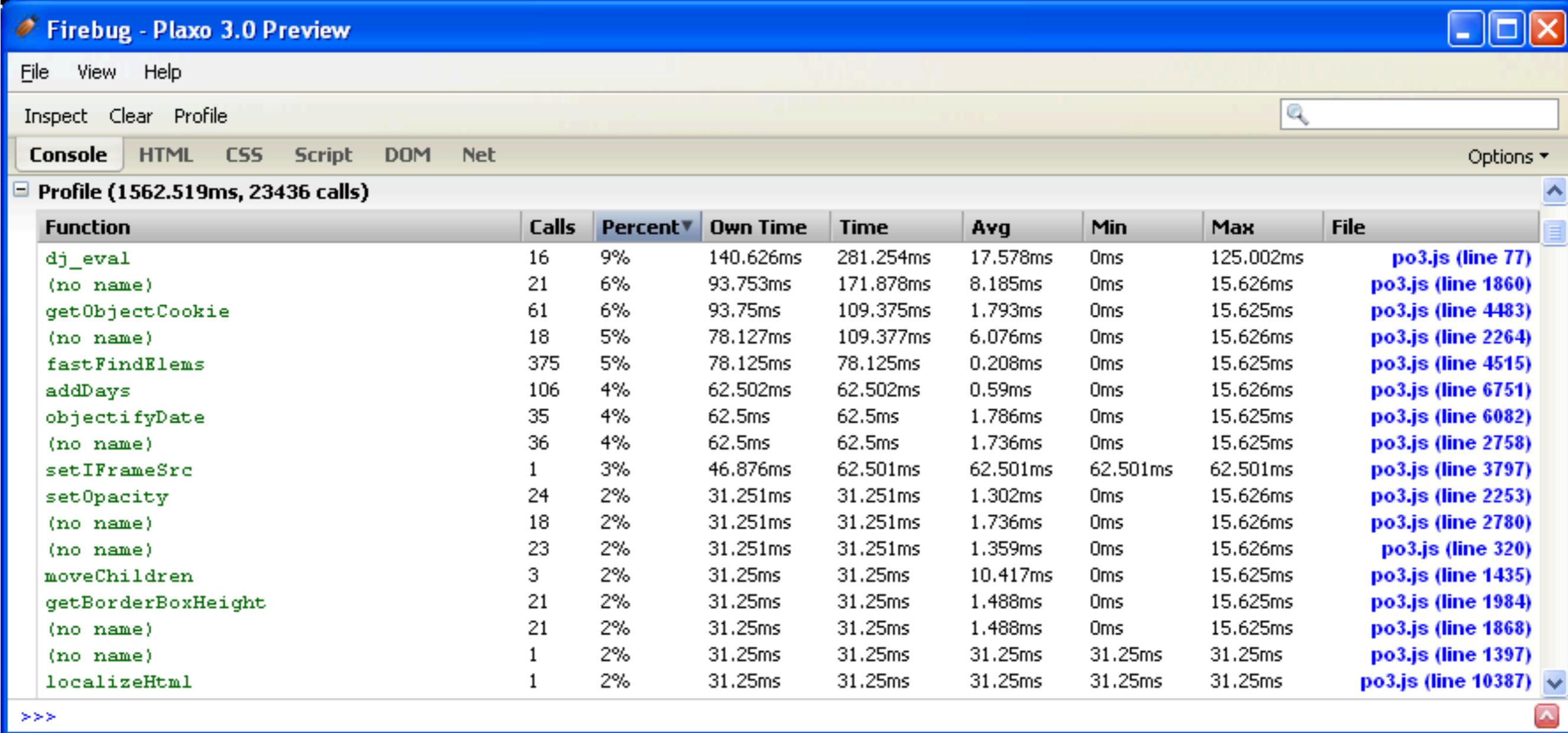
- Flexible desktop
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# Why JavaScript is special

- Downloading / running **source code** in the browser
  - Downloading / running JS blocks the browser
  - Code from different domains executing together
  - Extremely open, flexible, dynamic language
- à You can do a lot of good, and a lot of harm!

# Firebug: A web hacker's best friend

- DOM inspector, CSS tweaker, profiler, and more!



The screenshot shows the Firebug - Plaxo 3.0 Preview window. The 'Profile' tab is active, displaying a table of function calls. The table has columns for Function, Calls, Percent, Own Time, Time, Avg, Min, Max, and File. The data is as follows:

Function	Calls	Percent	Own Time	Time	Avg	Min	Max	File
<code>dj_eval</code>	16	9%	140.626ms	281.254ms	17.578ms	0ms	125.002ms	<a href="#">po3.js (line 77)</a>
<code>(no name)</code>	21	6%	93.753ms	171.878ms	8.185ms	0ms	15.626ms	<a href="#">po3.js (line 1860)</a>
<code>getObjectCookie</code>	61	6%	93.75ms	109.375ms	1.793ms	0ms	15.625ms	<a href="#">po3.js (line 4483)</a>
<code>(no name)</code>	18	5%	78.127ms	109.377ms	6.076ms	0ms	15.626ms	<a href="#">po3.js (line 2264)</a>
<code>fastFindElems</code>	375	5%	78.125ms	78.125ms	0.208ms	0ms	15.625ms	<a href="#">po3.js (line 4515)</a>
<code>addDays</code>	106	4%	62.502ms	62.502ms	0.59ms	0ms	15.626ms	<a href="#">po3.js (line 6751)</a>
<code>objectifyDate</code>	35	4%	62.5ms	62.5ms	1.786ms	0ms	15.625ms	<a href="#">po3.js (line 6082)</a>
<code>(no name)</code>	36	4%	62.5ms	62.5ms	1.736ms	0ms	15.625ms	<a href="#">po3.js (line 2758)</a>
<code>setIFrameSrc</code>	1	3%	46.876ms	62.501ms	62.501ms	62.501ms	62.501ms	<a href="#">po3.js (line 3797)</a>
<code>setOpacity</code>	24	2%	31.251ms	31.251ms	1.302ms	0ms	15.626ms	<a href="#">po3.js (line 2253)</a>
<code>(no name)</code>	18	2%	31.251ms	31.251ms	1.736ms	0ms	15.626ms	<a href="#">po3.js (line 2780)</a>
<code>(no name)</code>	23	2%	31.251ms	31.251ms	1.359ms	0ms	15.626ms	<a href="#">po3.js (line 320)</a>
<code>moveChildren</code>	3	2%	31.25ms	31.25ms	10.417ms	0ms	15.625ms	<a href="#">po3.js (line 1435)</a>
<code>getBorderBoxHeight</code>	21	2%	31.25ms	31.25ms	1.488ms	0ms	15.625ms	<a href="#">po3.js (line 1984)</a>
<code>(no name)</code>	21	2%	31.25ms	31.25ms	1.488ms	0ms	15.625ms	<a href="#">po3.js (line 1868)</a>
<code>(no name)</code>	1	2%	31.25ms	31.25ms	31.25ms	31.25ms	31.25ms	<a href="#">po3.js (line 1397)</a>
<code>localizeHtml</code>	1	2%	31.25ms	31.25ms	31.25ms	31.25ms	31.25ms	<a href="#">po3.js (line 10387)</a>

# Secrets to high-performance widgets

- Write less code
- Draw HTML efficiently
- Yield early and often
- Profile like crazy

# Drawing HTML efficiently

- document.write vs. DOM manipulation vs. innerHTML
- Attaching event handlers (direct vs. listeners)
- Drawing immediately vs. later (e.g. onload)
- Yielding (staging load, responsiveness)
  - Use `setTimeout(func, 0)` to yield to the browser UI
  - <http://www.josephsmarr.com/oscon-js/yield.html>

# Software design best practices

- Packages / namespaces for your code
  - `plaxo.widget.doSomething()`
  - Private vars (I tend not to use them)
- Global vs. instance objects
  - Multiple copies of your widgets on the same page?
- Event system
  - Don't steal / clobber existing event handlers
- Load on-demand if you have a lot of code
  - Use a framework like dojo, etc.

# Communication / security

- Same-origin policy (can't normally talk between sites)
- Using JSON + callbacks for 3<sup>rd</sup> party API calls
- Security issues (3<sup>rd</sup> party access to cookies, etc.)
- No personally identifiable info in 3rd-party JSON calls (w/o auth token)
- Danger of raw eval (use pre-eval JSON regex)

```
if (/^[\\],:{}_s]*$/ .test(this.replace(/\\./g, '@') .
replace(/"[^"\\n\r]*"|true|false|null|-?\d+(?:\.\d*)?(?:[eE][+-]?\d+)?/g, ']').replace(/(?:^|:|,)(?:\s*\[)+/g, ''))) {
    // ... you're safe!
}
```

# Conclusion: You have the power

- JavaScript is wonderfully powerful and flexible
  - ...so don't make your host sites slow or insecure! J
- Follow the “High-Performance JavaScript Mantra”:
  - Be Lazy, Be Responsive, Be Pragmatic, Be Vigilant

## Want more?

- <http://yuiblog.com/blog/2007/08/29/video-smarr/>
- <http://josephsmarr.com/2007/07/25/high-performance-javascript-oscon-2007/>
- <http://josephsmarr.com/2007/01/27/cross-site-ajax-oscon-2006/>